

WE CLAIM:

1. A hot water heating system for heating  
potable water, said heater being diesel powered and  
comprising a burner, an exhaust stack carrying hot exhaust  
emanating from said burner, a water jacket surrounding said  
burner for carrying potable water and being enclosed by an  
outer periphery, said exhaust stack running from said burner  
through said water jacket, said exhaust stack carrying said  
hot exhaust through said water jacket and discharging said  
hot exhaust from said outer periphery of said water jacket.

2. A hot water heater as in claim 1 wherein said  
exhaust stack has a rectangular cross-sectional  
configuration.

3. A hot water heater as in claim 1 wherein said  
exhaust stack is circular.

4. A hot water heater as in claim 1 wherein said  
exhaust makes a single pass through said water jacket before  
discharge from said outer periphery of said water jacket.

5. A hot water heater as in claim 1 wherein said exhaust makes at least two passes through said water jacket before discharge of said exhaust from said outer periphery of said water jacket.

5 6. A hot water heater as in claim 1 wherein said exhaust stack contacts said liquid within said water jacket on all sides of said exhaust stack.

10 7. A hot water jacket as in claim 1 wherein said exhaust stack contacts said liquid within said water jacket on at least one side of said exhaust stack

8. A hot water heating system as in claim 1 wherein said heater is used for boats or vehicles.

15 9. A hot water heating system as in claim 1 and further comprising operating components associated with said heating system and being located within a housing which housing surrounds said burner, said operating components being located at and accessible from one end of said heating system upon removal of a portion of said housing.

10. A hot water heating system as in claim 9  
wherein said operating components include a burner assembly,  
a compressor, a combustion fan and a fuel pump.

5           11. A hot water heating system as in claim 10 and  
further comprising a hot water outlet and a cold water inlet  
located on said one end of said heating system.

10           12. A hot water heating system with a burner and  
operating components associated with said burner, said  
burner and said operating components being located within a  
housing, said operating components being located at and  
accessible from one end of said heating system upon removal  
of a portion of said housing.

15           13. A hot water heating system as in claim 12  
wherein said operating components include a burner assembly,  
a compressor, a combustion fan and a fuel pump.

14. A hot water heating system as in claim 13 and  
further comprising a hot water outlet and a cold water inlet  
located at said one end of said heating system.

15. A hot water heating system as in claim 1 and further comprising a zone heater operably connected to said hot water heating system through a heat exchanger.

16. A hot water heating system as in claim 1  
5 wherein said potable water is circulated through said heat exchanger by a first pump and wherein coolant is circulated through said zone heater and said heat exchanger by a second pump.

17. A hot water heating system as in claim 16 and  
10 further comprising a thermostat operably connected to said zone heater to initiate operation of said zone heater when said thermostat includes a zone temperature below a predetermined value.

18. A hot water heating system as in claim 17 and  
15 further comprising a first aquastat associated with said zone heater to initiate and to terminate operation of a fan associated with said zone heater.

19. A hot water heating system as in claim 18 and further comprising an aquastat associated with said potable

water circulated through said heat exchanger, said aquastat terminating operation of said first pump when said aquastat measures a temperature which has fallen below a predetermined value.

5                 20. Method of increasing the temperature of potable water used for human consumption, said potable water being carried in a water jacket surrounding a burner having a peripheral housing and which burner discharges hot exhaust from said peripheral housing, said method comprising  
10                 conveying said hot exhaust from said burner through said water jacket to said peripheral housing and discharging said hot exhaust from said peripheral housing.

15                 21. Method as in claim 20 wherein said hot exhaust is discharged from said peripheral housing after making one pass through said water jacket.

22. Method as in claim 20 wherein said hot exhaust is discharged from said peripheral housing after making more than one pass through said water jacket.

23. Method as in claim 20 wherein said potable

water is for marine or vehicle use.

24. A hot water heater for heating potable water  
for human consumption, said heater being diesel powered and  
comprising a burner, an exhaust stack carrying hot exhaust  
emanating from said burner, a water jacket surrounding said  
burner for carrying potable water and being enclosed by an  
outer periphery and end portions on opposite ends of said  
burner in contact with said potable water, each of said end  
portions having a concave inside surface contacting said  
potable water in said water jacket.

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25. A hot water heater as in claim 24 wherein  
said heater is for boats or vehicles.

26. A hot water heater as in claim 24 wherein  
said heater is for residential use.

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27. A hot water heating system for heating  
potable water, said heater being diesel powered and  
comprising a burner, an exhaust stack carrying hot exhaust  
emanating from said burner, a water jacket surrounding said  
burner for carrying potable water and being enclosed by an

outer periphery, said exhaust stack running from said burner through said water jacket, said exhaust stack carrying said hot exhaust through said water jacket and discharging said hot exhaust from said outer periphery of said water jacket.

5               28. A hot water heating system as in claim 27 and further comprising a zone heater operably connected to said water jacket and located remotely from said burner of said heating system in a living environment, said potable water in said water jacket circulating through a heat exchanger operably associated with said zone heater thereby  
10              simultaneously providing hot water for the personal use of a user and providing hot water which is operably associated with said zone heater.

15              29. A hot water heating system as in claim 28 wherein said zone heater includes a fan for conveying hot air from said zone heater into said living environment.

20              30. A water level sensor in a potable water and diesel powered heater, said water level sensor producing a signal when said water within said heater is beneath a predetermined level, said signal being operable to terminate

operation of said heater.

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31. Coolant heater for heating coolant and circulating said heated coolant through a boat, vehicle or other living area, said coolant heater comprising a coolant stack carrying gases from a burner, said coolant stack being located within a coolant jacket and said coolant stack terminating in an exhaust stack releasing said hot gases to the atmosphere, said coolant stack being in a configuration that allows said exhaust stack to exit said water heater at at least two exhaust stack exit locations.